

## Amendments to the Claims

1. (currently amended) A method for classifying measured data into ~~multiple~~  
 $N$  classes, the measured data in each ~~class~~ of the  $N$  classes having a class-  
conditional probability distribution, comprising:

projecting the class-conditional probability distributions of the  
measured data into a likelihood space, in which the projected class-  
conditional probability distributions are estimated, and in which  $P_X(X|C_1)$ ,  
 $P_X(X|C_2)$ , ...,  $P_X(X|C_N)$  represent true distributions of the measured data from  
each of the  $N$  classes, the subscripted  $X$  of the probability  $P$  represents a  
random vector, the  $X$  within the parentheses represents a specific instance of  
the random vector  $X$ , and the probability  $P$  represents the probability that the  
random vector  $X$  takes the value  $X$ , given that the value  $X$  of the random  
vector  $X$  belongs to class  $C_i$ , where  $i$  is an integer from 1 to  $N$ , and estimates  
of the true distributions are  $\tilde{P}_X(X|C_1)$ ,  $\tilde{P}_X(X|C_2)$ , ...,  $\tilde{P}_X(X|C_N)$ , and the  
likelihood projection of the random vector  $X$  is an operation  $L_N(X)$ , resulting  
in an  $N$ -dimensional likelihood vector  $Y_X$ , and the likelihood vector  $Y_X$  is  
 $Y_X = L_X(X) = [\log(\tilde{P}_X(X|C_1)) \log(\tilde{P}_X(X|C_2)) \dots \log(\tilde{P}_X(X|C_N))]$ , and

classifying the projected class-conditional probability distributions in  
the likelihood space according to a discriminant classifier in the likelihood  
space.

2. (original) The method of claim 1, in which the projecting is non-linear.

3. (currently amended) The method of claim 1, in which the measured data  
are discrete.

1 4. (currently amended) The method of claim 1, in which the measured data  
2 are continuous.

5. (canceled)

1 6. (currently amended) The method of ~~claim 5~~ claim 1, further comprising:  
2 applying a likelihood maximization process to training data to obtain  
3 the estimated class-conditional probability distributions.

7. (canceled)

1 8. (currently amended) The method of claim 1, in which the measured data  
2 represent a speech signal.

1 9. (currently amended) The method of claim 1, in which the measured data  
2 represent a visual signal.

1 10. (original) The method of claim 1, in which the discriminant classifier is a  
2 linear discriminant with a unit slope.

1 11. (currently amended) The method of claim 1, in which the discriminant  
2 classifier is a quadratic discriminant.

1 12. (currently amended) The method of claim 1, in which the discriminant  
2 classifier is a logistic regression.

- 1 13. (currently amended) The method of claim 1, in which the discriminant  
2 classifier ~~in the likelihood space~~ is a distribution-based classifier.
- 1 14. (currently amended) The method of claim 1, in which the projecting  
2 ~~distribution~~ operation is a Gaussian function.
- 1 15. (currently amended) The method of claim 1 in which the projecting  
2 ~~distribution~~ operation is a mixture of Gaussian functions.
- 1 16. (original) The method of claim 1, in which the projecting is invertible.